Original Research

The Effect Of Psychoeducation Based On Self Care Theory On Knowledge, Compliance, Independent Care And Blood Glucose Levels In Patients With Type 2 Diabetes Mellitus

Arief Candra Permana[1*], Eppy Setiyowati[2], Chilyatiz Zahroh[3]

[1] Program Studi Magister Terapan Keperawatan Fakultas Keperawatan Dan Kebidanan Universitas Nahdlatul Ulama Surabaya
[2,3] Fakultas Keperawatan Dan Kebidanan Universitas Nahdlatul Ulama Surabaya

ABSTRACT

Background: The style of modern society in dietary habits such as eating foods that are high in fat, sugar and frequent attendance at receptions or parties, tends to consume excessive food which can lead to an increase in blood sugar levels. The purpose of this study was to analyze the effect of psychoeducation based on self-care theory on knowledge, compliance, independent care and blood glucose levels in patients with type 2 diabetes mellitus.

Methods: This type of research uses a researched method that is an exploratory approach. In the first stage the type of descriptive qualitative research with a case study approach and in the second stage using a Quasy-Experimental research design with a pre posttest approach. Samples were taken using the simple random sampling method of 6 participants in stage I and stage II totaling 64 respondents consisting of 32 intervention groups and 32 control groups. The independent variable is psychoeducation based on self-care theory. Variables between knowledge, compliance, independent care. The dependent variable of blood glucose levels. The instrument uses interviews, knowledge, compliance questionnaires, glucometers and modules. The analysis used the MANOVA test with a significant value of = 0.05.

Results: Research in the first stage obtained 4 themes, namely knowledge, self-motivation, social motivation, behavioral skills. The results of the second stage of the study showed that there was an effect of psychoeducation based on self-care theory on knowledge (p=0.000), compliance (p=0.000), self-care independence (p=0.000), and blood glucose levels (p=0.000).

Conclusion: This intervention can be given to improve the quality of patient's health.

Cite this as: Permana, A., Setiyowati, E., & Zahroh, C. (2022). The Effect Of Psychoeducation Based On Self Care Theory On Knowledge, Compliance, Independent Care And Blood Glucose Levels In Patients With Type 2 Diabetes Mellitus. *Interest : Jurnal Ilmu Kesehatan*, 177-187. https://doi.org/10.37341/interest.v0i0.349

INTRODUCTION

Blood glucose levels in the intervention group after giving psychoeducation based on self-care theory have decreased, because they know the right way of living for diabetes mellitus patients such as diet, medication, physical activity and routine control so that their blood sugar levels can be monitored properly. The World Health Organization (WHO), predicts that the number of DM sufferers will skyrocket every year, both in Indonesia and the world. The style of modern society in dietary habits such as eating foods that are high in fat, sugar and frequent attendance at receptions or parties, tends to consume excessive food which can lead to an increase in blood sugar levels.

Type 2 diabetes mellitus is a chronic disease that has characteristics of hyperglycemia with long-term and short-term complications. Type 2 diabetes mellitus or Non-Insulin Dependent Diabetes Mellitus (NIDDM) occurs because pancreatic cells produce insulin in small amounts or experience insulin resistance. This is because the community has not been able to do it independently, namely self care which will affect the patient's ability to carry out activities including compliance in managing diet patterns, determining appropriate physical activity, monitoring blood glucose levels and being obedient in carrying out pharmacological therapy (Baraz, Zarea, & Bibi, 2018).

Type 2 diabetes mellitus has an increased risk of complications and can be life-threatening if self-management is not good (Mulyani, 2016). It is very necessary the ability to perform self-care independence, one of which is being able to control blood glucose levels so that there is no increase. The prevalence of type 2 diabetes mellitus is 90-95% of people with diabetes mellitus worldwide (Black & Hawks, 2014; Nadrati, 2021; Riskesdas, 2018; Septi, 2020; Tarwoto, 2012; Yunir et al., 2019). This is estimated to increase as the population ages to 19.9% or 111.2 million people aged 65-79 years. The figure is predicted to continue to increase to reach 578 million in 2030 and 7000 million in 2045.

The Southeast Asia region where Indonesia is located, ranks 3rd among 10 countries with the highest number of sufferers, which is 10.7 million. Indonesia is the only country in Southeast Asia on the list, so it can be estimated that Indonesia's contribution to the prevalence of diabetes cases in Southeast Asia can be estimated. International Diabetes Federation (IDF), an increase in the number of people with type 2 DM in Indonesia in 2013 to around 3.4% in 2018, with the number of people with type 2 diabetes mellitus in Central Kalimantan Province amounting to 1.68% (8,060 people) of all the number of people with type 2 diabetes mellitus in Indonesia (Riskesdas, 2020).

Based on the results of health research for people with type 2 diabetes mellitus in the East Waringin City District, it reached 1.2% in 2020 and will always increase every year (Dinkes Kotim, 2020). Based on medical record data for people with type 2 diabetes mellitus in 2020, outpatient visits in the Kota Besi Health Center Work Area, the incidence of type 2 diabetes mellitus in 2020 was 352 visits. Diabetes mellitus is always included in the top 10 diseases in the Kota Besi District. As the number of people with type 2 diabetes mellitus increases, it is caused by a lack of ability to perform independent care, one of which is by controlling blood glucose levels so that there is no increase(Setiawan & Suwardianto, 2021).

Effective intervention is given to respondents The nurse's role in this case is to carry out nursing care for both individuals and families, the aim is to improve mental, cognitive or belief functions as well as increase knowledge, patient and family

independence in compliance, independent care to control blood glucose levels. One effort that can be done by providing psychoeducation based on self-care theory (Arso Wibowo & Adianti, 2021; Ilmiati, 2021; Mushalpah, 2021; Sunartono, 2021) is to explain that psychoeducation is an action given to individuals to strengthen coping strategies or a special way to overcome psychoeducation problems experienced by someone. Psychoeducation is effective to improve mental health, anxiety and depression (Ain, 2021).

Supported by research conducted by *(R.Casanas et al., 2016)* psychoeducation is an effective therapy in treating mental health in adults, because it reduces symptoms of mental stress and can prevent anxiety or depression. Psychoeducation is an education/education that is carried out through an interactive process that encourages learning by using a psychological concept approach. Supported by research results (He et al., 2015) psychoeducation can improve self-care in self-care behavior, patient independence, medication adherence, self-confidence and psychological response and improve patient quality of life. The results of the study (Hadidi, 2015) psychoeducation can reduce blood pressure and control blood glucose in patients due to a good level of knowledge, effective coping, good compliance, so that it affects the physiological aspects.

Efforts to maximize the provision of psychoeducation can be done through a self-care theory-based approach. The concept of psychoeducation is to provide information to patients with diabetes mellitus with an approach to the psychological aspect as an effort to increase self-acceptance and gratitude for what is experienced. Orem's self-care theory defines self-care or self-care as the continuing contribution of adults to their existence, health, and well-being. Orem stated that self-care is a personal activity to maintain and maintain health and also prevent complications from diseases experienced by individuals.

Diabetes mellitus has a long-term impact on the life of a diabetic, which is characterized by signs and symptoms that appear and interfere with health. Self-care in diabetes is an important factor in controlling the disease, and almost 95% of diabetes care is influenced by the consistency of diabetes and its family. The purpose of this study was to analyze the effect of psychoeducation based on self-care theory on knowledge, compliance, independent care and blood glucose levels in patients with type 2 diabetes mellitus.). Self-care carried out by people with diabetes mellitus is regulating diet, physical activity, foot care, taking medication and monitoring blood sugar levels (Alligood, 2017).

Providing information to people with diabetes mellitus through psychoeducation based on self-care theory is interesting to study so that patients can improve the quality of life both psychologically and physiologically, so that by being given the influence of psychoeducation based on self-care theory, it is expected to increase patient knowledge and patient compliance.

MATERIALS AND METHOD

The design and type of research used in this study used research methods, namely an exploratory approach. This research is a research step by combining two forms of research, namely combining qualitative and quantitative research (Creswell, 2018). In the first stage the type of descriptive qualitative research is in the form of research using case study methods or approaches to get the theme and procedure of an action then in

the second stage with experimental research types or implementing qualitative research results in the treatment group and control group.

The purpose of the study was to analyze the effect of psychoeducation based on self care theory on knowledge, compliance, independent care and blood glucose levels in patients with type 2 diabetes mellitus in the work area of the Kota Besi Health Center. The first stage is the preparation of modules (literature review, field studies, and expert discussions). In this research, the second stage is collecting data and analyzing quantitative data in this case using Quasy-Experimental research with a pre-post-test control group design approach. This design attempts to reveal a causal relationship by involving a control group other than the intervention group (Nursalam, 2017).

In this design, the intervention group was given treatment in the form of psychoeducation based on self-care theory, while the control group was given educational intervention according to puskesmas standards based on self-care theory. In both groups, starting with a pre-test to measure knowledge, compliance (diet, activity and medication), independent care and blood glucose levels after giving treatment to the intervention group, a post-test was conducted in the intervention group and the control group. The population in this study were all patients with type 2 Diabetes Mellitus in the Kota Besi Health Center area.

Based on the sample calculation, the number of samples in the study was 32 respondents for each intervention and control group, so the total sample size was 64 people. The inclusion criteria in this study were type 2 DM patients aged > 45 years, the general condition of the patient was good, cooperative, able to read and write, the exclusion criteria in this study were type 2 diabetes mellitus patients with complications. The independent variable in this study is psychoeducation based on self care theory. The intermediate variables in this study were knowledge, adherence to independent care, the dependent variable in this study was blood glucose levels.

The research instrument used in addition to the human instrument, other data collection tools that support the research process are in-depth interview guidelines, field notes, and recording devices. The purpose of the next study was to analyze both the control group and the intervention group using parametric statistical tests with paired t-test and Manova. This research has ethical clearance (230/VIII/EC/2021).

RESULTS

The following is a table of the distribution of the average value of the influence of psychoeducation based on Self Care Theory.

Table 1. Distribution Of The Mean Value Of The Influence Of Psychoeducation Based On Self-Care Theory In The Work Area Of The Kota Besi Health Center 2021

Knowledge								
Min			Max			Mean		
Pre	Post	Delta	Pre	Post	Delta	Pre	Post	Delta
2,00	2,00	-5,00	8,00	9,00	0,00	4,52	6,02	-1,50
Obedience								
Min			Max			Mean		
Pre	Post	Delta	Pre	Post	Delta	Pre	Post	Delta
16,00	20,00	-40,00	31,00	63,00	0,00	23,87	37,30	-13,63
Care Independence								

	Min			Max			Mean	
Pre	Post	Delta	Pre	Post	Delta	Pre	Post	Delta
2,00	4,00	-15,00	13,00	21,00	0,00	7,34	11,94	-4,59

Blood Glucose Level

	Min			Max			Mean	
Pre	Post	Delta	Pre	Post	Delta	Pre	Post	Delta
125,00	90.00	-5,00	160,00	160,00	45,00	138,34	127,78	10,56

Based on table 1 above, it shows that the mean value for knowledge is 6.02, the highest (post test) with a maximum value of 9.00 and a minimum of 2.00. it shows that the mean value of the highest adherence 37.50 (post test) with a maximum value of 63.00 and a minimum of 20.00. It shows that the mean value for self-care independence is 11.94, the highest (post test) with a maximum value of 21.00 and a minimum of 4.00. Based on table 4 above, it shows that the mean value for the highest blood glucose level is 138.34 (pretest) with a maximum value of 160.00 and a minimum of 125.00.

Table 2. Knowledge Analysis Before and After Being Given a Psychoeducational Intervention Based on Self-Care Theory In The Intervention Group and The Control Group

Group	Var	Mean	N	SD	SE	95% CI	t	p value
Intervention	Before after	-2.344	32	1.181	.209	-2.769 - 1.918	-11.299	.000
Control	Before after	-656	32	.701	.124	-.909 - 4.04	-5.298	.000

Based on table 2 above, it shows that in the intervention group and control group before and after being given psychoeducation based on self-care theory, a p value (0.000) was obtained, so with the results of sig <0.05, this means that there is an influence in providing psychoeducation based on self-theory. care can increase their knowledge

Table 3. Analysis of Adherence Before and After Being Given a Psychoeducational Intervention Based on Self-Care Theory In The Intervention Group and The Control Group

Group	Var	Mean	N	SD	SE	95% CI	t	p value
Intervention	Before after	-24.313	32	8.910	1.575	-27.525 - 21.100	-15.436	.000
Control	Before after	-3.000	32	2.342	.414	-3.844 – 2.156	-7.247	.000

Based on table 3 above, it shows that in the intervention group and control group before and after being given psychoeducation based on self-care theory, a p value (0.000) was obtained, so with the results of sig <0.05, this means that there is an influence in providing psychoeducation based on self-theory. care can improve compliance.

Table 4. Analysis of Self-Care Independence Before and After Being Given a Psychoeducational Intervention Based on Self-Care Theory in The Intervention Group and The Control Group

Group	Var	Mean	N	SD	SE	95% CI	t	p value
Intervention	Before after	-8.875	32	2.587	.457	-9.808 -7.942	-19.405	.000
Control	Before after	-.313	32	.644	.114	-.545 - 080	-2.743	.010

Based on table 4 above, it shows that in the intervention group before and after the p value (0.000) was obtained, then the sig value <0.05, this means that there is an effect in increasing the independence of care in controlling blood glucose levels, while in the control group before and after After being given psychoeducation based on self-care theory, the p value (0.010) was obtained, so with the sig value > 0.05, this means that there is no effect in increasing the independence of care in controlling blood glucose levels.

Table 5. Analysis of Blood Glucose Levels Before and After Being Given a Psychoeducational Intervention Based on Self Care Theory In The Intervention Group and The Control Group

Group	Var	Mean	N	SD	SE	95% CI	t	p value
Intervention	Before after	20.125	32	13.392	2.367	15.297 24.953	8.501	.000
Control	Before after	1.000	32	3.152	.557	-.136 2.136	1.795	.082

Based on table 5 above, it shows that in the intervention group before and after the p value (0.000) was obtained, then with the sig value <0.05, this means that there is an influence in controlling blood glucose levels and while in the control group before and after being given psychoeducation based on self care theory obtained p value (0.082) then with the result of sig value > 0.05 this means that there is no effect in controlling blood glucose levels

Table 6. Distribution of Difference Values on Levels of Knowledge, Compliance, Independent Care and Blood Glucose Levels with The Influence of Psychoeducation Based on Self Care Theory in The Work Area Of The Kota Besi Health Center 2021

Variable	Knowledge Difference	Compliance Difference	Difference in Care Independence	KGD Difference
Mann-Whitney U	120.000	1.000	.000	60.500
Wilcoxon W	648.000	529.000	528.000	588.500
Z	-5.430	-6.872	-7.098	-6.077
Asymp. Sig. (2-tailed)	.000	.000	.000	.000

Based on table 6 shows that the value of the difference in knowledge, compliance, nursing independence and blood glucose levels with the provision of self-care theory-based psychoeducation in the intervention group and control group with a sig result is 0.000 then with a sig value <0.05 this means that there is an influence in providing

psychoeducation based on self-care theory on knowledge, compliance, independent care and blood glucose levels in type 2 diabetes mellitus.

DISCUSSION

Based on the results of statistical tests in the intervention group before and after the psychoeducation intervention based on self theory, it was found that there was a significant increase in the independence of care in controlling blood glucose levels, but in the control group who were given health education through the prolanis program, Orem's self-care theory defines self-care or self-care as an ongoing contribution to health and well-being. Self-care also has major assumptions that are closely related to diabetic foot care. Orem stated that self-care is a personal activity to maintain and maintain health and also prevent complications from diseases experienced by individuals (Feni Sudilarsih, 2010).

There was a decrease in the independence of care in controlling blood glucose levels. The difference in the increase in the value of the pre-test to the post-test in the intervention group was greater than the control group, there was a significant difference in the data difference. These results are in line with research (Istibsaroh, 2019; Nguyen et al., 2019), there are differences in independence in controlling blood glucose levels before and after being given a psychoeducation module based on self theory in the intervention group, causing sufferers to know firsthand how to control blood glucose levels by how to check blood sugar at the clinic or by controlling blood glucose levels through consuming herbal drinks that have been described in the module.

The results of the study show that most of the respondents have never received education about treatment in controlling blood glucose levels independently, which needs to be given early to patients suffering from diabetes mellitus as an effort to prevent diabetic complications (Damayanti, 2015). Orem's self-care theory defines self-care or self-care as an ongoing contribution to health and well-being. Self-care also has major assumptions that are closely related to diabetic foot care. Orem stated that self-care is a personal activity to maintain and maintain health and also prevent complications from diseases experienced by individuals (Feni Sudilarsih, 2010).

Diabetes mellitus has long-term consequences in the life of a diabetic, which is characterized by signs and symptoms that appear and interfere with health. Self-care in diabetes is an important factor in controlling the disease, and almost 95% of diabetic care is influenced by the consistency of people with diabetes and their families. Blood glucose levels in the intervention group after giving psychoeducation based on self-care theory have decreased, because they know the right way of living for diabetes mellitus patients such as diet, medication, physical activity and routine control so that their blood sugar levels can be monitored properly (Astuti et al., 2021; Istibsaroh, 2019; Suwardianto & YC, 2016).

However, there are some respondents who still show high blood glucose levels and do not experience a decrease because the respondents who have received good education do not apply a lifestyle that is in accordance with what has been conveyed. Uncontrolled blood glucose levels in patients with diabetes mellitus will cause various complications, both acute and chronic. This is in line with research showing that the average decrease in blood glucose levels after being given self-management education, because diabetic patients are given education about diet, medication, physical activity and how to control anxiety and depression.

In addition, research (Sheila, 2016; Farida, *et,al*, 2018) about DSME (Diabetes self-management education) interventions in the form of leaflets, namely diabetes mellitus education, diet regulation, pharmacology, physical exercise and monitoring blood glucose levels in patients with diabetes mellitus. Type 2 diabetes mellitus is proven in the results of his research showing a significant change in decreasing blood glucose levels in patients with diabetes mellitus. Another study, according to (Jasmani, 2016), showed the results that DM patients who received good education had lower blood glucose levels compared to patients with poor education. Controlled blood glucose can be achieved by compliance with DM patients in adhering to diet, activity and medication.

Providing psychoeducation based on self-care theory for type 2 diabetes mellitus patients which consists of information, personal motivation, social motivation and behavioral skills where respondents interact through problems (diet, drugs and physical activity), respondents will feel less anxious, more relaxed and calm. So that compliance with the control of blood sugar levels will increase. According to research, the results show that the provision of educational interventions can increase knowledge related to disease, exercise, food intake and self-efficacy and health literature. the provision of support groups according to research, shows the results that the provision of OSG (online support groups) plays an important role in the decision-making process for treatment.

Factors that affect blood glucose levels are not only knowledge, dietary compliance but can be influenced by confounding factors, namely age, gender, drug adherence, physical activity, stress, knowledge, family support, obesity, hypertension, smoking and length of suffering. DM (Perkeni, 2015; WHO Global Report, 2016) Suyuno (2012) According to the American Diabetes Association (ADA) (American Diabetes Association, 2017; Isnaini & Ratnasari, 2018; Soegondo, 2009) diabetes is a chronic and complex disease that requires medical care. With a strategy to control various risks in order to achieve the target of controlling blood glucose levels.

Education about self-care and disease management is very important to prevent acute complications and reduce the risk of long-term complications. The effect of giving psychoeducation based on self-care theory on blood glucose levels shows that there are differences in blood glucose levels before and after the average decreases. This is because respondents who have been given the intervention have changed their health behavior based on knowledge about a healthy lifestyle for people with diabetes mellitus so that their blood glucose levels are controlled.

CONCLUSION

Knowledge of respondents with type 2 diabetes mellitus given the intervention increased their knowledge. The compliance of respondents with type 2 diabetes mellitus given psychoeducation increased knowledge and compliance (diet, medication and activity) for 4 meetings in 4 weeks. Independent care of respondents with type 2 diabetes mellitus was given an intervention, there was an increase in knowledge and skills in performing care independently to prevent an increase in blood glucose levels.

Blood glucose levels of respondents with type 2 diabetes mellitus were given a self-care intervention, the average blood sugar level decreased, but did not reach the normal limit because a small number of respondents did not apply a lifestyle that was in accordance with what had been conveyed. The results showed that psychoeducation

interventions based on self-care theory given to patients with type 2 diabetes mellitus can increase knowledge, compliance, self-care independence and reduce blood glucose levels. So that this intervention can be applied as an education in providing nursing care in an effort to improve services at the Puskesmas.

REFERENCES

Ain, I. (2021). Health Education On Anxiety Levels In Projective Surgery Patients In Mokoyurli Buol Hospital. *Journal of Applied Nursing and Health*, *3*(1 SE-Articles), 15–21. https://janh.candle.or.id/index.php/janh/article/view/20

Alligood, M. & T. A. (2014). *Nursing Theorist and Their Work* (Sixth Edit). St. Louis Mosby.

American Diabetes Association. (2017). *Standards of Medical Care in Diabetes 2017"*. *Vol. 40*.

Arso Wibowo, D., & Adianti, N. (2021). The Motivation Of Adolescents In Preventing Gastritis Return In SMP Negeri 1 Karangjati, Karangjati District, Ngawi Regency. *Journal of Applied Nursing and Health*, *3*(2 SE-Articles). https://janh.candle.or.id/index.php/janh/article/view/12

Astuti, V. W., Yusiana, M. A., Richard, S. D., & Suwardianto, H. (2021). Peningkatan Pengetahuan Masyarakat Tentang Kesehatan Melalui Home Care Pada Masyarakat Blimbing Tarokan Kabupaten Kediri. *Pelita Abdi Masyarakat*, *1*(2), 54–58.

Black, J. M., & Hawks, J. H. (2014). *Keperawatan Medika Bedah Manajemen Klinis Untuk Hasil Yang Diharapkan Edisi 8 Buku 2* (A. Suslia (ed.); Edisi 8). Penerbit Salemba Medika.

Creswell, J. W. (2016). *Research Design Pendekatan Kualitatif, Kuantitatif dan Mixed*. Pustaka Belajar.

Damayanti. (2015). *Diabetes mellitus dan penatalaksanaan keperawatan*. Nuha Medika.

He, H. G., Chan, S. W. C., Chen, H. C., Cheng, K. K. F., & Vathsala, A. (2015). The Effectiveness Of Self- Efficacy Phsychoeducational Intervension In Enhancing Outcomes Of Patients Undergoing Haemodialysis Due To End Stage Renal Disease. *HNE Handover for Nurses and Midwives*, *8*(2), 7494.

Ilmiati, I. (2021). Health Education On Mother's Knowledge And Skills In Care Of Kanguru Methods In LBW In Peristi's Room At Mokopido Tolitoli Hospital . *Journal of Applied Nursing and Health*, *3*(2 SE-Articles), 25–32. https://janh.candle.or.id/index.php/janh/article/view/6

Isnaini, N., & Ratnasari, R. (2018). Faktor risiko mempengaruhi kejadian Diabetes

mellitus tipe dua. *Jurnal Kebidanan Dan Keperawatan Aisyiyah*, *14*(1), 59–68. https://doi.org/10.31101/jkk.550

Istibsaroh, F. (2019). PENGARUH KONSELING CLIENT CENTERED THERAPY MODEL OREM TERHADAP KADAR GLUKOSA DARAH DAN TINGKAT KEMANDIRIAN PASIEN DIABETES MELLITUS TIPE 2. In *Keperawatan*. Universitas Nahdlatul Ulama Surabaya.

Mushalpah, M. (2021). Factors That Influence The Event Of Low Birth Weight In The Room Of Peristi In Tolitoly General Hospitals . *Journal of Applied Nursing and Health*, *3*(2 SE-Articles), 17–24. https://janh.candle.or.id/index.php/janh/article/view/5

Nadrati, B. (2021). *Buerger Allen Exercise dan Ankle Brachial Indeks (ABI) Pada Penyandang Diabetes Melitus*. NEM.

Nguyen, T. P. L., Edwards, H., Do, T. N. D., & Finlayson, K. (2019). Effectiveness of a theory-based foot care education program (3STEPFUN) in improving foot self-care behaviours and foot risk factors for ulceration in people with type 2 diabetes. *Diabetes Research and Clinical Practice*, *152*, 29–38. https://doi.org/10.1016/j.diabres.2019.05.003

Nursalam. (2017). *Metodologi Penelitian Ilmu Keperawatan Pendekatan Praktis, Edisi 7*. Salemba Medika.

Perkeni. (2015). *Konsensus Pengelolaan dan Pencegahan Diabetes Mellitus di Indonesia*.

Riskesdas. (2018). Hasil Utama Riset Kesehatan Dasar. In *Kementrian Kesehatan Republik Indonesia*. https://doi.org/1 Desember 2013

Septi, S. (2020). *Management Terapi Pada Penyakit Degeneratif*. Graniti.

Setiawan, L., & Suwardianto, H. (2021). Community Stigma Against COVID-19 Patients . *Journal of Applied Nursing and Health*, *3*(2 SE-Articles), 33–41. https://janh.candle.or.id/index.php/janh/article/view/7

Soegondo, S. (2009). *penatalaksanaan diabetes melitus terpadu* (edisi ke d).

Sunartono, S. (2021). Multimedia Quality About Risk Dating As A Youth Health Promotion Media . *Journal of Applied Nursing and Health*, *3*(2 SE-Articles), 1–6. https://janh.candle.or.id/index.php/janh/article/view/4

Suwardianto, H., & YC, A. (2016). Kemandirian Fungsional Lansia Diabetes Melitus Di Kelurahan Bangsal Kota Kediri. *Jurnal STIKES RS Baptis Kediri*, *9*(1).

Suyuno, S. (2009). *Penatalaksanaan diabates melitus terpadu* (edisi ke d).

Tarwoto. (2012). *Keperawatan Medikal Bedah Gangguan Sistem Endokrin* (Jusirm@n (ed.)). CV. Trans Info Media.

WHO Global Report. (2016). Global Report on Diabetes. *Isbn*, *978*, 6–86.

Yunir, E., Esa, D. F., Prahasary, A. N., & Tahapary, D. L. (2019). Penyakit Arteri Perifer dan Mortalitas Kardiovaskular pada Pasien Diabetes Melitus Tipe-2. *Jurnal Penyakit Dalam Indonesia*, *6*(2), 100. https://doi.org/10.7454/jpdi.v6i2.299